ARMAND RATHGEB

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EDUCATION

Bachelor of Science in Biomedical Engineering August 2020 - May 2024
University of Texas at Dallas, GPA: 3.841/5.00
Minor in Computer Science

PhD in Biomedical Engineering August 2024 -
University of Texas Southwestern Medical Center

SKILLS AND INTERESTS

Interests Computational Neuroscience, Time Representation in the Brain, Working memory, Statistical modeling, Dynamical systems analysis, Bayesian statistics

Skills C++, Python, Matlab, C# programming, Statistics, Augmented Reality, Arduino, Linux

PROJECTS

Automated Whole-slide Scanning Desktop App 2021-2024
Unpublished Research Project

- Development of an integrated system for scanning whole-slide images with Hyperspectral and RGB projects.
- Developed in C++ with the Qt6 UI framework.
- Integrated Python plugin API.
- OpenCV integration for fast autofocus algorithm.
- CMake build system.
- Fully documented using Doxygen.

Bleeding Control Trainer with Augmented Reality Interface August 2023-May 2024
Senior Design Project

- Engineering design project for the UT Southwestern simulation center.
- Developed in Unity with C#.
- Worked with Microsoft HoloLens AR headset.
- Microsoft mixed reality toolkit used.
- QR code tracking for real-time registration between AR space and real world.

Electrospinning Pump for Producing Polyethylene Oxide Fibers August-December 2023
Junior Design Project

- Automated system for the extrusion of Polyethylene Oxide fibers on a small scale.
- Programmed in C++ with Arduino.
- Analog button and knob inputs with digital display output for precise control.

TRAINING

(2024-) Graduate Research Assistant in Computational Neuroscience Lab under Dr. Wenhao Zhang at UT Southwestern

(2021-2024) Undergraduate Research Assistant in the Quantitative Bioimaging Lab under Dr. Baowei Fei at UT Dallas

PUBLICATIONS

Undergraduate Publications 2021-2025

Ma L., Ha A., Zainab I., **Rathgeb A.**, Mubarak H., Fei B., *An automatic processing framework for hyperspectral histologic images and benchmark dataset*, Proc. SPIE, Medical Imaging: Digital and Computational Pathology, 2025, doi: 10.1117/12.3047743

· Pruitt K., Ma L., **Rathgeb A.**, Gahan J., Johnson B., Strand D., Fei, B., *Design and validation of a high-speed hyperspectral laparoscopic imaging system*, Journal of Biomedical Optics, 2024, doi: 0.1117/1.JBO.29.9.093506

· Bettati P., Young J., **Rathgeb A.**, ..., *An augmented reality-guided biopsy system using a high-speed motion tracking and real-time registration platform*, Proc SPIE Int Soc Opt Eng., 2024, doi: 10.1117/12.3008573

· Fraser R., Bettati P., Young J. **Rathgeb A.**, Shashank S., Fei B., *A Fast and Interactive Augmented Reality System for PET/CT-guided Intervention of Neuroblastoma*, Proc SPIE Int Soc Opt Eng, 2024, doi: 10.1117/12.3008663

· Nawawithan N., Young J., Bettati P. **Rathgeb A.**, ..., *An augmented reality and high-speed optical tracking system for laparoscopic surgery*, Proc SPIE Int Soc Opt Eng., 2024, doi: 10.1117/12.3008448

· Pruitt K., **Rathgeb A.**, Gahan J., Johnson B., Strand D., Fei B., *A dual-camera hyperspectral laparoscopic imaging system*, Proc. SPIE 12831, Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems, 2024, doi: 10.1117/12.3005893

· **Rathgeb A.**, Ma L., Tran M., Fei B., *Extended depth of field imaging for mosaic hyperspectral images*, Proc. SPIE Digital and Computational Pathology, 2023, doi: 10.1117/12.2653923

· Ma L., **Rathgeb A.**, Mubarak H., Tran M. Fei B., *Unsupervised Super Resolution Network for Hyperspectral Histologic Imaging*, Journal of Biomedical Optics, 2022, doi: 10.1117/1.JBO.27.5.056502